NOTES, ABSTRACTS, AND REVIEWS.

ROME MEETING OF THE INTERNATIONAL UNION OF GEODESY AND GEOPHYSICS.

The agenda for the Rome meeting of the International Union of Geodesy and Geophysics have just been received, and a translation is published herewith:

International Union of Geodesy and Geophysics.

ASSEMBLY IN ROME CALLED FOR MAY 2, 1922.

SECTION OF METEOROLOGY.

Order of the Day.

1. Communication of the Chairman on the constitution of the Section.
2. Organization of the Committee of the Section.
3. General consideration of scientific and practical objects of the Section.
   Ultimate relations with other Sections of the Union, with other meteorological associations, and with academies of science.
   Communication of the Officers to the Union—letter from Switzerland.
4. Scientific questions proposed by the various national committees.

Proposals of the National Committee of France.

1. The different kinds of thunder storms, and more generally the atmospheric electric phenomena.
2. The clearness of the atmosphere and associated optical phenomena.
3. The different kinds of clouds.
4. The forecasting of weather, and particularly the method of [barometric] tendencies.

Proposals of the National Committee of Great Britain.

5. *The study of the upper atmosphere by sounding balloons.*—What the regions are in which there is need for new researches, and what the probabilities are for obtaining observations in the given regions.

6. *Relation between vertical convection and horizontal movement.*—Certain experiments seem to indicate that the mechanical effect of the penetration through the upper layers ought to determine the convergence of aerial currents, and thus provoke movements of one form or another, having the nature of eddies displacing themselves in a horizontal direction.

Evidence is desired, based on observation, of the nature and extent of the displacement of air by convection; also concerning the real trajectory of air in motion taking account of both horizontal and vertical motion.

7. *The control of movements of air in the stratosphere and the troposphere.*—The movement of air in the troposphere such as has been actually observed ought to be largely influenced by penetrating convection, but the same influence can not be very considerable in the stratosphere, which (and it is generally admitted) is not subjected to penetrating convection. The displacements produced in the stratosphere ought therefore, to be less complicated than in the troposphere, and the laws which control them ought to be simpler.

It is necessary to consider the displacements of air in the stratosphere, both from the point of view of theory and of observation. Mr. W. H. Dines has submitted the results of observations which seem to indicate that in England there exists a relation between variations of pressure and variations of temperature, very close and direct in the troposphere, but not so close and in an inverse sense in the stratosphere. The simultaneous values of temperature, pressure, and wind direction in the stratosphere are worthy of attention.

8. *Radiation and its influence on the temperature of the surface, the air and the sea.*—It is strongly desired that the time element be studied in relation to radiation phenomena in the atmosphere. The theories generally suppose the existence of final conditions, and the question of knowing how much time is necessary for final conditions to be attained is of prime importance.

9. *Relation between visibility at the surface and the quantity of dust in the surface layers.*—The committee advises the study of the pollution of the atmosphere and suggests two methods for determining effectively the proportion of impurities suspended as solids in the air. The first determines by filtration the proportion of solid matter existing in two liters of air; in the other the solid impurities contained in 50 cc. are projected on to a thin plate of glass in such a manner that they may be examined.

The question of visability and of atmospheric impurities are of international interest. This study is ready for international collaboration.

10. *The composition of the atmosphere in the upper layers.*—There is too much difference between the results of different investigators on the composition of the atmosphere at altitudes above 20 kilometers.

According to different investigators the composition of the extreme layers of the atmosphere is (1) hydrogen, (2) geocoronium, or (3) helium.

If we succeed in agreeing upon the process of computation and on the results, the differences must necessarily depend upon the data to which this computation is applied. It is important, therefore, to approve new steps for the solution of this problem and to know whether it is a question of the revision of calculation methods or of new experiments, in order to obtain satisfactory data for carrying on the calculation.

The atmosphere above 20 kilometers presents such problems as (i) the composition, density, and temperature of the air at different heights, (ii) the aurora and its spectrum, (iii) the electromagnetic phenomena and their relation to various magnetic variations and irregular magnetic perturbations, and (iv) the absorption of solar rays which do not penetrate as far as the lower strata.

Proposals of the National Committee of Italy.

11. *Meteorological data in relation to modern methods of statistics.*—The methods of presenting the normal values of the different climatological elements with regard to the demands of modern statistical methods.

—*C. L. M.*

RAINFALL AT PAGO PAGO HARBOR, TUTUILA, SAMOA.

Through the courtesy of Capt. W. Evans, United States Navy, Governor of American Samoa, and Lieut. F. C. Nyland, United States Navy, superintendent of public works, Island Government, the Weather Bureau is able to present a table showing the monthly rainfall at Tutuila, Samoa, for the years 1900–1920, inclusive. The measurements were made at the United States Naval Station at Pago Pago Harbor.

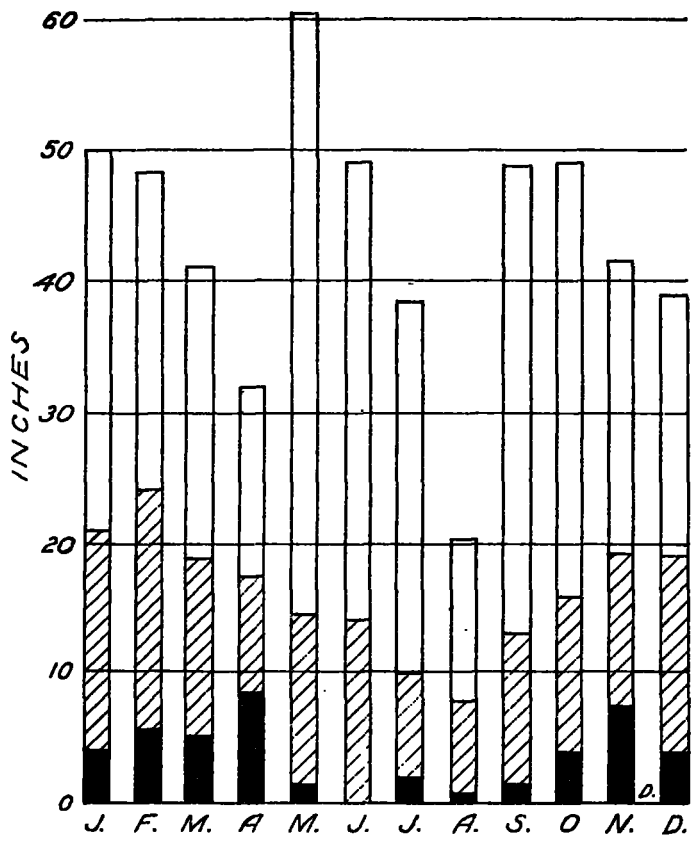

FIG. 1.—Rainfall at Pago Pago, Samoa. Highest, lowest, and average monthly amounts for years 1900–1920, inclusive.

A chart (Fig. 1) showing the highest, lowest, and average monthly amounts, adapted from a chart prepared by Lieut. Nyland, is also shown.

Tutuila is the southernmost island of the Samoan, or Navigator, group and is located in latitude 14° 18′ S., longitude 170° 42′ W. Pago Pago Harbor is on the south side of the island, some 85 miles east-southeast of Apia. Meteorological observations have been made at Apia for

many years and a chart (fig. 2) showing the average rainfall at that place is given in order that the amounts received at the two stations may be compared. Apia is situated on the north, or leeward, side of Upolu Island, the second largest island of the Samoan group.

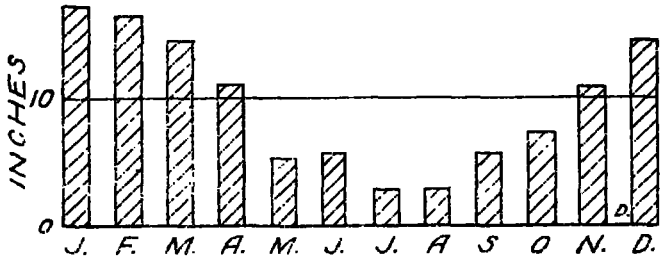

FIG. 2.—Rainfall at Apia, Samoa. Average monthly amounts.

Rainfall record, United States Naval Station, Pago Pago, Tutuila, 1900–1920.

[Inches.]

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Total.
1900	16.4	18.3	41.1	13.1	11.3	0.1	4.5	3.0	5.9	9.8	19.6	24.1	167.2
1901	21.5	29.0	17.1	9.4	15.1	3.5	10.4	6.2	21.6	21.2	18.4	3.9	177.3
1902	12.9	37.9	5.2	14.2	5.7	25.2	3.0	4.4	5.0	8.7	11.0	14.4	147.6
1903	21.9	24.9	12.7	26.0	12.1	12.5	16.6	11.2	10.3	19.9	20.4	10.8	199.3
1904	21.2	27.2	10.5	21.3	8.3	11.0	10.5	13.1	10.9	9.3	21.9	10.9	176.1
1905	21.8	12.1	15.5	16.0	3.5	10.3	7.5	10.6	1.7	8.7	12.3	10.1	130.1
1906	5.3	9.9	18.0	14.1	18.6	14.7	6.1	7.4	12.7	13.2	14.2	13.0	147.2
1907	19.2	21.2	11.3	26.1	13.1	32.0	12.5	5.0	11.1	23.7	29.0	17.9	222.1
1908	32.6	48.3	39.5	13.7	23.8	9.2	8.2	10.4	28.5	16.1	11.7	12.4	284.4
1909	16.1	15.1	11.6	13.8	15.5	9.8	3.6	3.6	8.1	11.8	19.9	16.2	145.1
1910	20.7	10.2	28.1	19.7	9.5	16.3	3.4	11.6	17.8	15.1	15.2	30.9	198.5
1911	18.8	30.2	19.3	11.7	12.3	5.2	5.2	2.3	5.0	12.3	9.4	18.1	149.8
1912	15.1	7.7	22.3	31.9	30.8	12.1	4.5	3.5	14.7	10.4	20.0	22.4	195.4
1913	27.7	44.7	17.8	25.5	60.5	12.5	21.8	5.4	17.2	18.6	7.5	16.0	275.2
1914	4.0	20.4	14.7	18.1	9.4	19.5	10.7	20.4	48.9	49.2	16.1	19.2	250.6
1915	37.5	7.9	17.6	10.7	1.7	4.5	16.4	0.6	10.0	10.1	8.7	30.6	156.3
1916	14.5	28.6	9.1	12.2	14.0	12.1	9.6	10.6	11.0	18.9	26.5	39.0	206.1
1917	38.3	34.6	34.0	22.2	5.4	20.7	7.5	5.8	7.8	19.5	29.8	24.3	249.9
1918	15.1	43.1	17.9	10.9	7.6	8.7	38.3	6.7	5.8	7.4	15.0	30.4	206.9
1919	49.8	22.6	16.5	8.4	14.8	9.6	2.0	4.7	11.3	3.9	16.9	14.4	174.9
1920	14.7	13.4	21.6	28.7	12.7	49.2	8.5	18.8	8.6	26.4	31.1	23.4	257.1
Average	21.2	24.2	19.1	17.5	14.6	14.2	10.0	7.9	13.0	15.9	19.3	19.2	196.1

—*F. G. T.*

CANADIAN WINTER WEATHER.

The following brief summary of weather conditions in Canada in October and November has been prepared by Sir Frederick Stupart, Director of the Canadian Meteorological Office, in response to a request from the EDITOR:

Reports from the Mackenzie River are not available.

Reports from the basins of the Athabaska and Slave Rivers and for the vicinity of Great Slave Lake may be summarized as follows:

October.—Although heavy frosts occurred occasionally in the districts of the upper Athabaska and along the shores of Great Slave Lake and frequently in other localities, the weather for the first four weeks was rather mild. A moderate cold wave spread into the region during the last few days of the month and ice started to form along the shores of the bays and inlets of Great Slave Lake.

November.—Moderately cold weather for the first few days was followed by a pronounced cold wave experienced in the northern districts from the 3d to 6th and in the south from 5th to 8th. During the cold dip minimum temperatures of zero or a few degrees below were registered in all localities reporting and the bays and inlets of Great Slave Lake were frozen over sufficiently for crossing by sleighs. The moderately cold weather following continued until the middle of the month when winter set in in earnest. Temperatures ranged from zero to 20 below during the last half of the month.

THE FORECASTING OF WINDS FOR AERIAL NAVIGATION.

Success in future aerial navigation will depend largely upon the forecasting of upper winds; but results to date have been surprisingly erroneous according to G. M. B. Dobson, in a paper presented before the Royal Meteorological Society (*Quarterly Journal Royal Meteorological Society*, October 1921, vol. 47, pp. 261–269). Investigating thoroughly, with forecasts based on the estimates of future pressure gradients, he has found primarily the Daily Weather Report inaccurate to a marked degree, but with more copious charts the results obtained would be only slightly improved. The inability to forecast, first, the general pressure distribution, second, the irregularities of pressure around cyclones and anticyclones, third, the unsettled pressure distribution without specified high-or-low-pressure centers, are considered some of the causes for such poor results. But the principle cause, and the one apparently responsible for most of the errors, is the lack of knowledge concerning the small irregularities of pressure distribution around the centers of low pressure. If this knowledge could be obtained perfectly, forecasts of wind directions could be determined with much certainty although the velocities would still be doubtful.

Although much credit was given Mr. Dobson by the attendant members of the Society for such exactness in his report, still his paper was not without criticism from Col. E. Gold, Sir Napier Shaw, Mr. J. S. Dines, and others who vigorously defended the intrinsic value of the synoptic charts.

He (Mr. Dobson) stated with emphasis that in all his studies utility was distinctly omitted, his experiments being chiefly for academic purposes; but, congruous to the ideas of L. H. Richardson, he contended that prior to bringing errors in pressure gradient forecasting to a minimum, maps of greater detail are absolutely essential.

M. G. R.

RADIO WEATHER REPORTS ON THE PACIFIC COAST.

In order to better serve the marine and aviation interests operating in the coastal waters of the Pacific and the States bordering the Pacific coast, a new program of broadcasting weather information will be undertaken by the Weather Bureau in cooperation with the Navy Department, beginning March 15, 1922. In addition to major bulletins, issued at noon and 10:30 p. m., 75th meridian time, from the San Francisco Naval Radio Station, there will be local bulletins issued at various times of day from the Naval Radio Stations at Tatoosh Island, Wash., North Head, Wash., Eureka, Calif., San Pedro, Calif., Dutch Harbor, Alaska, and Honolulu, Hawaii. The major bulletins from the San Francisco station are divided into two parts, the first giving surface data at 8 a. m. and 8 p. m. (75th meridian time) and upper-air data for the afternoon of the date of distribution; the second part contains a synopsis of general conditions, barometer readings at centers of HIGHS and LOWS, wind and weather forecasts, and flying weather forecasts for the areas concerned. The local bulletins refer to weather forecasts and storm warning and local weather at the station. The six stations issuing local reports may be called upon by ships at any time for the latest warnings or forecasts. Complete information concerning the new service is contained in a bulletin issued by the Forecast Division of the Weather Bureau under date of March 1, 1922. A new base map of the regions concerned has been prepared, and will be furnished free to vessel masters who regularly take and forward weather observations to the Weather Bureau or the Navy Hydrographic Office; to others they will be available at 75 cents per hundred.

It is of interest to note that this new program extends to the Pacific coast a type of service that has been recently put in operation along the Atlantic and Gulf coasts and in the Caribbean Sea. With the establishment of this service, the entire coast of the United States and the waters adjacent thereto will enjoy an equally complete system of weather reports.—*C. L. M.*